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09/435,824	11/08/1999	KIYOSHIGE SHIBAZAKI	103210.01	5721

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OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER

NGUYEN, LUONG TRUNG

ART UNIT	PAPER NUMBER
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2612

DATE MAILED: 10/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/435,824

Applicant(s)

SHIBAZAKI ET AL.

Examiner

LUONG T NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 20-25 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-7, 15-19 and 26-30 is/are allowed.
- 6) ☒ Claim(s) 1, 8-12 and 17 is/are rejected.
- 7) ☒ Claim(s) 13 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 November 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received. (Japanese Patent Application No. 10-317896 filed 11/09/98)
2. ☒ Certified copies of the priority documents have been received in Application No. 09/288,654.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of invention Group I, claims 1-9, 26-30 in the reply filed on 6/15/04 is acknowledged. The traversal is on the ground(s) that the search and examination of the entire application could be made without serious burden. This is not found persuasive because the inventions Group I and Group II are distinct because they have a separate status in the art as shown by their different classification, Group I (claims 1-19, 26-30) drawn to an image-capturing element comprising color filters, classified in class 348, subclass 273, while Group II (claims 20-25) drawn to an image-capturing element for processing a signal comprising clamp circuit and plurality of sample and hold circuits, classified in class 348, subclass 312. Therefore, they have different search, the search for group I does not require the search for clamp circuit and plurality of sample and hold circuits as claimed in Group II.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 20-25 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on June 15, 2004.

Priority

3. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copies (Japanese Patent Applications No. 10-116266 filed 04/10/98, 10-116267 filed 04/10/98, 10-116268 filed 04/10/98, 10-249198 filed 08/19/98) have

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been filed in parent Application No. 09/288,654, filed on 04/09/99. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

4. Receipt is acknowledged of paper (Japanese Patent Application No. 10-317896 filed November 9, 1998) submitted under 35 U.S.C. 119(a)-(d), which paper has been placed of record in the file.

Drawings

5. The drawings are objected to because the formalities addressed in form PTO 948. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified

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and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6. Figures 26A-26C should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

7. Claims 26, 28-30 are objected to because of the following informalities:

Claim 26 (lines 20-21), claim 28 (line 20), "an second pixel group" should be changed to --a second pixel group--.

Claim 28 (line 1), claim 29 (line 1), "A image-capturing device" should be changed to --An image-capturing device--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Watanabe (US 6,529,236).

Regarding claim 1, Watanabe discloses an image-capturing element (image sensor 22, figure 1A, column 4, lines 5-15), comprising a plurality of pixels (plurality of photodiodes, figure 3, column 4, lines 15-34) provided in a matrix, each having a photoelectric conversion element; a plurality of color filters (RGB color filter, column 4, lines 10-15), each provided at one of said plurality of pixels; and a read out circuit that adds together electrical charges of pixels within every specific range among said plurality of pixels and enables a sequential read out of added electrical charges (column 4, lines 35-67).

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 8-9, 12, 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato et al. (US 4,775,885).

Regarding claims 8, 9, Sato et al. discloses an image-capturing element (image sensor 11, figure 4), comprising a plurality of pixels provided in a matrix each having a photoelectric conversion element (figure 5A), wherein color filters of a single color (green color at portions

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A12, A22, figure 5A, column 5, lines 25-35), are provided at each group of a specific number of pixels (group four picture element portions A11, A12, A21, A22) lying adjacent to each other among said plurality of pixels; and a read out circuit is provided that adds together electrical charges of the specific number of pixels lying adjacent to each other and sequentially reads out added electrical charges (figure 5A, column 6, lines 40-65); a drive circuit that provides said read out circuit with a drive signal to enable said read out circuit to add together electrical charges of the specific number of pixels lying adjacent to each other and enables a sequential read out of added electrical charges (Sato et al. discloses signal charges at four picture element portions A11, A12, A21, A22 are added together and read out, figure 5A, column 6, lines 40-65). Therefore, a drive circuit that provides a drive signal is inherently included in the system in order to add and read out charges).

Regarding claim 12, Sato et al. discloses an image-capturing element (image sensor 11, figure 4) comprising a plurality of pixels provided in a matrix, each having a photoelectric conversion element (figure 5C); and a plurality of color filters (figure 5C, column 5, lines 25-35), each provided at one of said plurality of pixels, wherein among said plurality of color filters, color filters of a single color (green) are provided for pixels within each specific range (a range of four element portions A11-A12, A21-A22, figure 5C) and the color filters within the specific range have different transmissivities (color filters green, Y_e' , C_y' , have different transmissivities, figure 5C, column 8, lines 7-15).

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Regarding claim 17, all the limitations are contained in claim 12, therefore, see Examiner's comments regarding claim 12, except for the limitation "a read out circuit" and "a drive circuit" are disclosed in Sato et al. (column 6, lines 45-65, column 8, lines 7-38).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (US 4,775,885) in view of Iizuka (US 6,686,960).

Regarding claim 10, Sato et al. fails to disclose an image-capturing device, wherein said image-capturing element has (d x m in a horizontal direction) x (e x n in a vertical direction) pixels, the m, n, d and e representing natural numbers; and said read out circuit in response to the drive signal provided by said drive circuit, adds together electrical charges of d x e pixels adjacent to each other for a read out and enables a read out of (m in a horizontal direction) x (n in a vertical direction) pixel signals. However, Iizuka teaches a system and method for driving an imaging device, in which the CCD image pickup 1 has (d x m in a horizontal direction) x (e x n in a vertical direction) pixels (in figure 6, for example, d = 3, m = 2, e = 1, n = 2); the charges in each block of three pixels are added and read out (figure 6, column 9, lines 10-47). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to the device in Sato et al. by the teaching of Iizuka in order to

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provide a method for driving a solid-state image pickup apparatus which enables fast operation and makes applicable of the conventional algorithm in processing signals (column 3, lines 43-46).

Regarding claim 11, Sato et al. fails to disclose a selection unit that selects a mode for reading out the (m in a horizontal direction) x (n in s vertical direction) pixel signals or a mode for reading out the (d x m in a horizontal direction) x (e x n in a vertical direction) pixel signals without adding. However, Iizuka teaches a system and method for driving an imaging device, which includes a switching mode of operation between a mode in which mixed charges that result from adding signal charges of predetermined pixels from one block are output and a normal mode for outputting all pixel information (see abstract, column 18, lines 1-19). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to the device in Sato et al. by the teaching of Iizuka in order to allow the operator select a desired mode for reading signal.

Allowable Subject Matter

14. Claims 2-3, 4-7, 15-19, 26-30 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 2 and 4, the prior art of the record fails to show or fairly suggest an image-capturing element, comprising wherein a green color filter is provided at each of 2 x c pixels, a blue color filter is provided at each of 1 x c pixels and a red color filter is provided at each of remaining 1 x c pixels within a range of 4 x c pixels adjacent to each other vertically and

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horizontally among said plurality of pixels, the c representing a natural number; and a read out circuit is further provided that adds electrical charges of the $4 \times c$ pixels adjacent to each other vertically and horizontally and enables a sequential read out of added electrical charges.

Claim 3 is allowable for the reason given respect to claim 2.

Claims 5-7 are allowable for the reason given respect to claim 4.

Regarding claim 15 is, the prior art of the record fails to show or fairly suggest an image-capturing device, comprising a plurality of color filters being provided at the plurality of pixels respectively, the color filters being of a single color within each specific range, the color filters within said specific range having different transmissivities, and a read out circuit that adds together electrical charges of the pixels within said specific range and enables a sequential read out of added electrical charges.

Claim 16 is allowable for the reason given respect to claim 15.

Regarding claim 18, the prior art of the record fails to show or fairly suggest an image-capturing device, comprising a drive circuit that provides said read out circuit with a drive signal to enable said read out circuit to add electrical charge signals obtained from pixels with color filters thereof lying adjacent to each other, being of a single color and having the same transmissivity and then to enable a read out of added electrical charge signals, and also to enable said read out circuit to independently read out electrical charge signals obtained from the pixels with color filters thereof lying adjacent to each other, being of a single color and achieving different transmissivities without adding the electrical charge signals together.

Claim 19 is allowable for the reason given respect to claim 18.

Regarding claim 28, the prior art of the record fails to show or fairly suggest an image-capturing device comprising an image-capturing element that has $2 \times a \times m$ pixels along a horizontal direction and $2 \times b \times n$ pixels along a vertical direction, the image-capturing element having a color filter array in which color filters of a single color are arranged at every first pixel group that has $2 \times a$ pixels along a horizontal direction and $2 \times b$ pixels along a vertical direction adjacent to each other, a color arrangement of the color filters at every first pixel group achieving a Bayer array, the a , b , m and n each representing a natural number; and a drive control device that implements drive control of the image-capturing element to add together individual pixels in a second pixel group achieved by shifting by " a " pixels in the horizontal direction and by " b " pixels in the vertical direction relative to a position of the first pixel group for readout when the monochrome image mode is selected.

Claim 30 is allowable for the reason given respect to claim 28.

Claims 26 is the method claims of apparatus claim 28. Therefore, claim 26 is allowable for the reason given respect to claim 28.

Regarding claim 29, the prior art of the record fails to show or fairly suggest an image-capturing device comprising an image-capturing element that has a plurality of pixels arranged in a matrix, the image capturing element having a color filter array in which color filters of a single color are arranged at every four pixels adjacent to each other in vertical and horizontal directions,

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a color arrangement of the color filters at every said four pixels achieving a Bayer array; a drive control device that implements drive control of the image-capturing element to add together other four pixels achieved by shifting by one pixel in the horizontal direction and by one pixel in the vertical direction relative to a position of said four pixels for readout when the monochrome image mode is selected.

Claims 27 is the method claims of apparatus claim 29. Therefore, claim 27 is allowable for the reason given respect to claim 29.

15. Claims 13-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Teranishi et al. (US 4,939,573) discloses color filter arrangement comprising transparent or white filters for solid state color imaging apparatus.

Sawanobori (US 5,956,086) discloses image indicating device and imaging device.

Ishigami (US 6,189,507) discloses solid-state imaging device, method of driving solid-state imaging device, camera device, and camera system.

Uneo (US 6,496,224) discloses imaging device including thinned read out mode and all pixel read out mode.

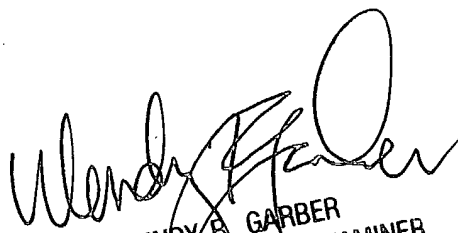
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17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T NGUYEN whose telephone number is (703) 308-9297. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on (703) 305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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WENDY A. GARBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600